PREMIER 2

P/N 96P557A01 rev. 2/99

WaterFurnace

Installation Guide

Geothermal System Single-Speed Installation and Maintenance Manual 208-230/60/1 & 208-230/60/3

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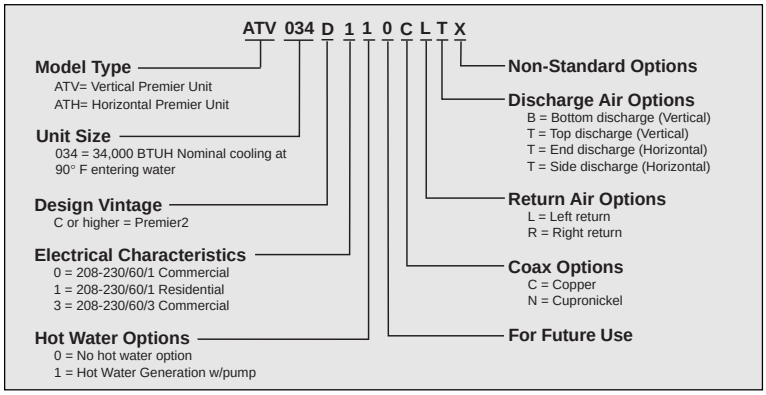
Model Nomenclature


ATV 034 D 1 1 0 C L T X
Model Type
ATV= Vertical Premier Unit
ATH= Horizontal Premier Unit
Unit Size
034 = 34,000 BTUH Nominal cooling at 90° F entering water
Design Vintage
C or higher = Premier2
Electrical Characteristics
0 = 208-230/60/1 Commercial
1 = 208-230/60/1 Residential
3 = 208-230/60/3 Commercial
Hot Water Options
0 = No hot water option
1 = Hot Water Generation w/pump
Non-Standard Options
Discharge Air Options
B = Bottom discharge (Vertical)
T = Top discharge (Vertical)
T = End discharge (Horizontal)
T = Side discharge (Horizontal)
Return Air Options
L = Left return
R = Right return
Coax Options
C = Copper
N = Cupronickel
For Future Use

Safety Considerations

STOP **WARNING: Before performing service or maintenance operations on a system, turn off main power switches to the indoor unit. If applicable, turn off the accessory heater power switch. Electrical shock could cause personal injury.**

Installing and servicing heating and air conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair or service heating and air conditioning equipment.

Untrained personnel can perform the basic maintenance functions of cleaning coils and cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on heating and air conditioning equipment, observe precautions in the literature, tags and labels attached to the unit and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use a quenching cloth for brazing operations and have a fire extinguisher available.

Moving and Storage

Move units in the normal “up” orientation as indicated by the arrows on each carton. Horizontal units may be moved and stored per the information on the carton. Do not stack more than three units in total height. Vertical units may be stored one upon another to a maximum height of two units. Do not attempt to move units while stacked. When the equipment is received, all items should be carefully checked against the bill of lading to be sure all crates and cartons have been received. Examine units for shipping damage, removing the units from the cartons if necessary. Units in question should also be internally inspected. If any damage is noted, the carrier should make the proper notation on the delivery receipt, acknowledging the damage.

Physical Data

MODEL	AT019D	AT022C/D	AT028D	AT034D	AT040D	AT046D	AT056D	AT066D
Fan Wheel	9 x 7	9 x 7	9 x 7	9 x 7	11 x 10	11 x 10	11 x 10	11 x 10
Fan Motor	ECM2-1/2	ECM2-1/2	ECM2-1/2	ECM2-1/2*	ECM2-1/2*	ECM2-1/2*	ECM2-1	ECM2-1
Compressor	Rotary	Rotary	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Air Coil: (Vertical)								
Dimensions	19 x 20	24 x 20	24 x 20	27 x 20	28 x 25	28 x 25	32 x 25	36 x 25
Area (sq. ft.)	2.6	3.3	3.3	3.8	4.9	4.9	5.6	6.3
Rows	3	3	3	3	3	3	3	3
Air Coil: (Horizontal)								
Dimensions	18 x 21	18 x 27	18 x 27	18 x 30	20 x 35	20 x 35	20 x 40	20 x 45
Area (sq. ft.)	2.6	3.4	3.4	3.8	4.9	4.9	5.6	6.3
Rows	3	3	3	3	3	3	3	3
R22 (oz.)	43.0	58.0	62.0	65.0	85.0	88.0	116.0	98.0
Filter-1" (Vertical)								
Throwaway	20 x 24	24 x 24		2-14 x 24	2-14 x 30		2-10x30 1-12x30	3-12x30
Electrostatic	EAF2024	EAF2424		EAF2428	EAF2830		EAF2042	EAF2048
Filter-1" (Horizontal)								
Throwaway	18 x 24	2-18 x 18		2-18 x 18	1-20 x 12, 1-20 x 25		1-18x20 1-24x20	2-24x20
Electrostatic	EAF1824	EAF1836		EAF1836	EAF2037		EAF2042	EAF2048
Weight (lbs.)-Vertical	189	252	258	274	320	336	399	426
Weight (lbs.)-Horizontal	210	256	260	270	337	339	429	456

* Optional 1 hp ECM2 fan motor available

General Installation Information

UNIT LOCATION

⚠ **CAUTION:** *Do not locate in areas where ambient conditions are not maintained within 45°-95°F and less than 75% relative humidity.*

Locate the unit in an indoor area that allows for easy removal of the filter and access panels. Location should have enough space for service personnel to perform maintenance or repair. Provide sufficient room to make water, electrical and duct connection(s). If the unit is located in a confined space, such as a closet, provisions must be made for return air to freely enter the space by means of a louvered door, etc. Any access panel screws that would be difficult to remove after the unit is installed should be removed prior to setting the unit. On horizontal units, allow adequate room below the unit for a condensate drain trap and do not locate the unit above supply piping. These units are not approved for outdoor installation and, therefore, must be installed inside the structure being conditioned.

SETTING VERTICAL UNITS

Vertical units are available in left or right air return configurations. Top flow vertical units should be mounted level on a vibration absorbing pad slightly larger than the base to provide isolation between the unit and the floor. It is not necessary to anchor the unit to the floor (see Figure 1). Bottom flow units should be mounted level and well sealed to the floor to prevent air leakage.

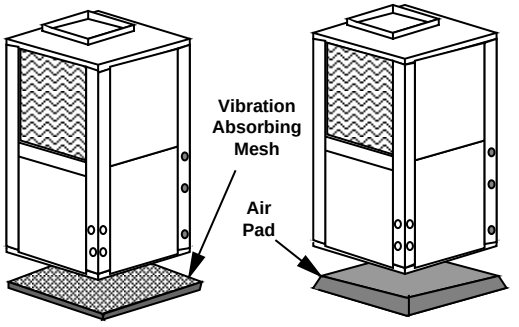


Figure 1 – *Vertical Unit Mounting*

NOTE: *If access to the left side of the unit will be limited after installation, remove the two mounting screws on the left side of the control box before setting the unit (leave the two front mounting screws intact). This will allow the control box to be removed with only the two front mounting screws for future service.*

SETTING HORIZONTAL UNITS

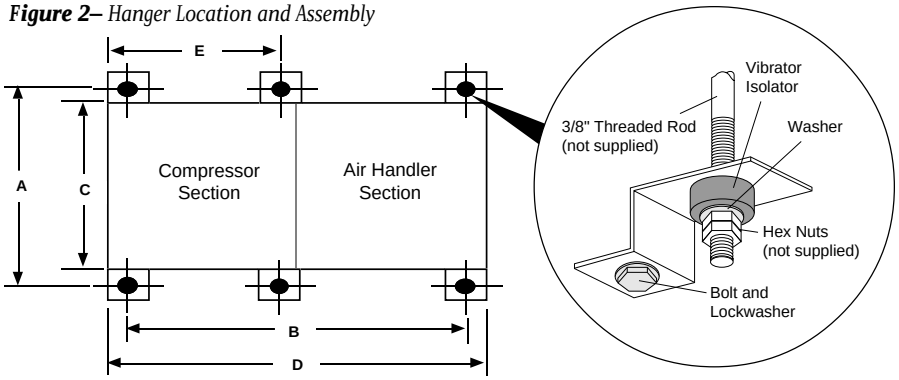
⚠ **CAUTION:** *Do not use rods smaller than 3/8" diameter since they may not be strong enough to support the unit. The rods must be securely anchored to the ceiling.*

Horizontal units are available with side or end discharge and may be field converted from one to the other by replacing the discharge panel (TB920813) with a new panel which must be ordered separately. Horizontal units are normally suspended from a ceiling by four 3/8" diameter threaded rods (six on ATH040-066). The rods are usually attached to the unit by hanger bracket kits furnished with each unit.

Lay out the threaded rods per the dimensions in Figure 2. Assemble the hangers to the unit as shown. Securely tighten the brackets to the unit using the weld nuts located on the underside of the bottom panel. When attaching the hanger rods to the bracket, a double nut is recommended since vibration could loosen a single nut. The unit should be pitched approximately 1/4” towards the drain in both directions to facilitate the removal of condensate. (see Figure 5A on page 5). Use only the bolts provided in the kit. The use of longer bolts could damage internal parts.

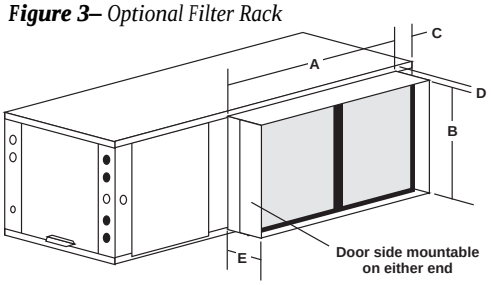
Some residential applications require the installation of horizontal units on an attic floor. In this case, the unit should be set in a full size secondary drain pan on top of a vibration absorbing mesh. The secondary drain pan prevents possible condensate overflow or water leakage damage to the ceiling. The secondary drain pan is usually placed on a plywood base isolated from the ceiling joists by additional layers of vibration absorbing mesh.

Figure 2– *Hanger Location and Assembly*



MODEL	A	B	C	D	E
ATH019	24.8	51.5	22.5	53.0	-
ATH022, 028, 34	24.8	61.5	22.5	63.0	-
ATH040, 046	27.8	70.5	25.5	72.0	29.9
ATH056	27.8	75.5	25.5	77.0	29.9
ATH066	27.8	80.5	25.5	82.0	29.9

Figure 3– *Optional Filter Rack*



Horizontal Filter Rack

MODEL	A	B	C	D	E	Model No.
ATH019	24.5	18.1	2.5	0.5	5.5	DCH1824
ATH022, 028	36.1	18.1	2.0	0.5	5.5	DCH1836
ATH034	36.1	18.1	2.0	0.5	5.5	DCH1836
ATH040, 046	37.1	20.1	2.2	0.6	5.5	DCH2037
ATH056	42.1	20.1	2.2	0.6	5.5	DCH2042
ATH066	47.1	20.1	2.2	0.6	5.5	DCH2048

1" duct connection is provided.
Construction is air tight.

DUCT SYSTEM

⚠ **CAUTION:** *Be sure to remove the shipping material from the blower throat before connecting ductwork.*

An air outlet collar is provided on vertical top flow units and all horizontal units to facilitate a duct connection (vertical bottom flow units have no collar). A flexible connector is recommended for discharge and return air duct connections on metal duct systems. Uninsulated duct should be insulated with a minimum of 1" duct insulation. Application of the unit to uninsulated ductwork in an unconditioned space is not recommended as the unit’s performance will be adversely affected.

For vertical bottom flow units, cut the floor opening for air discharge at least 1/2" larger than the unit air outlet. **Protect opening edges in combustible flooring with a sheet metal overwrap. Discharge air only into a suitable supply duct system and do not locate registers or openings directly under unit air outlet.**

If the unit is connected to existing ductwork, check the duct system to ensure that it has the capacity to accommodate the air required for the unit application. If the duct is too small, as in the replacement of heating only systems, larger ductwork should be installed. All existing ductwork should be checked for leaks and repairs.

The duct system should be sized to handle the design airflow quietly. Due to increased run time at lower airflows, the Premier 2 diffusers should be sized for 75% of design airflow. **To maximize sound attenuation of the unit blower, the supply and return plenums should include an internal duct liner of fiberglass or constructed of ductboard for the first few feet.** If air noise or excessive airflow is a problem, the blower speed can be changed (see the Blower Speed and Blower Performance sections on pages 19 and 20).

WATER PIPING

All Residential Premier 2 source water connections are swivel piping fittings that accept a 1" male pipe thread (MPT) (see Figure 4A). The swivel connector has a rubber gasket seal similar to a rubber hose gasket, which when mated to the flush end of any 1" threaded pipe provides a leak-free seal without the need for thread sealing tape or compound. **Check to ensure that the rubber seal is in the swivel connector prior to attempting any connection.** The rubber seals are shipped attached to the air coil inside the blower compartment.

To make the connection to a ground loop system, mate the brass connector (supplied in CK4L and CK4S connector kits) against the rubber gasket in the swivel connector and thread the female locking ring onto the pipe threads, while maintaining the brass connector in the desired direction (see Figure 4B). Tighten the connectors by hand, then gently snug the fitting with pliers to provide a leak-proof joint. When connecting to an open loop (groundwater) system, thread any 1" MPT fitting (PVC or copper) into the swivel connector and tighten in the same manner as noted above. **The open and closed loop piping system should include pressure/temperature taps for serviceability.**

Never use flexible hoses smaller than 1" inside diameter on the unit. Limit hose length to 10 ft. per connection. Check carefully for water leaks.

Figure 4A

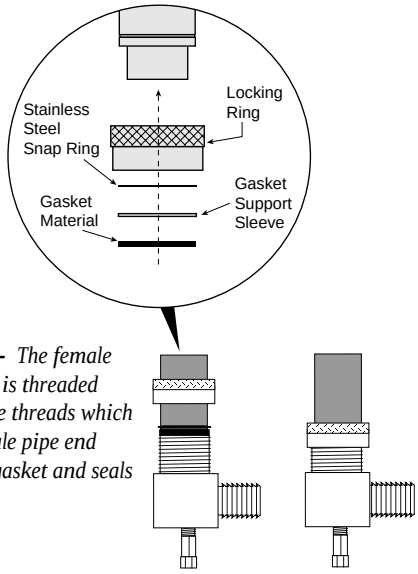


Figure 4B - *The female locking ring is threaded onto the pipe threads which holds the male pipe end against the gasket and seals the joint.*

WATER QUALITY

The unit may be ordered with either a copper or a cupronickel coaxial heat exchanger. Copper is adequate for closed loop and open loop groundwater systems which are not high in mineral content. In conditions anticipating moderate scale formation or in brackish water, a cupronickel heat exchanger is recommended. In groundwater situations where scaling could be heavy or where biological growth such as iron bacteria will be present, a closed loop system is recommended. The heat exchanger coils in groundwater systems may over a period of time lose heat exchange capabilities due to a buildup of mineral deposits inside. These can be cleaned, but only by a qualified service mechanic as acid and special pumping equipment are required. **Desuperheater coils can likewise become scaled and possibly plugged. In areas with extremely hard water, the owner should be informed that the heat exchanger may require occasional acid flushing.**

FREEZE PROTECTION

Set the freeze protection switch SW2-2 on the printed circuit board for applications using a closed loop antifreeze solution to "LOOP". On applications using an open loop/groundwater system, set to "WELL" (the factory setting).

CONDENSATE DRAIN

On vertical units, the internal condensate drain assembly consists of a drain tube which is connected to the drain pan, a 3/4" PVC female adapter and a flexible connecting hose. The female adapter may exit either the front or the side of the cabinet. The adapter should be glued to the field-installed PVC condensate piping. On vertical units, a condensate hose is inside all cabinets as a trapping loop; therefore, an external trap is not necessary. On horizontal units, a copper stub is provided for condensate drain piping connection. An external trap is required (see Figure 5B). If a vent is necessary, an open stand pipe may be applied to a tee in the field-installed condensate piping.

Figure 5A - *Unit Pitch for Drain*

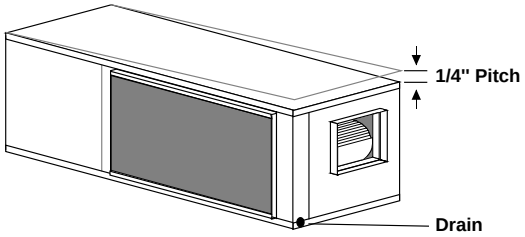
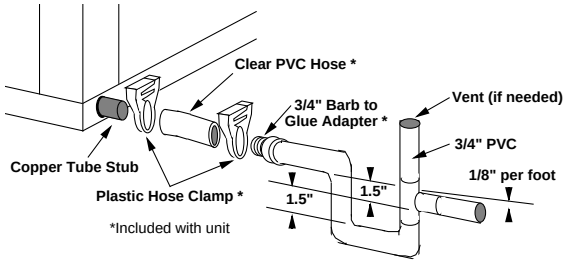


Figure 5B - *Horizontal Drain Connection*



AIR COIL

To obtain maximum performance, the air coil should be cleaned before start-up. A 10 percent solution of dishwasher detergent and water is recommended for both sides of the coil; a thorough water rinse should follow.

COOLER/BOILER

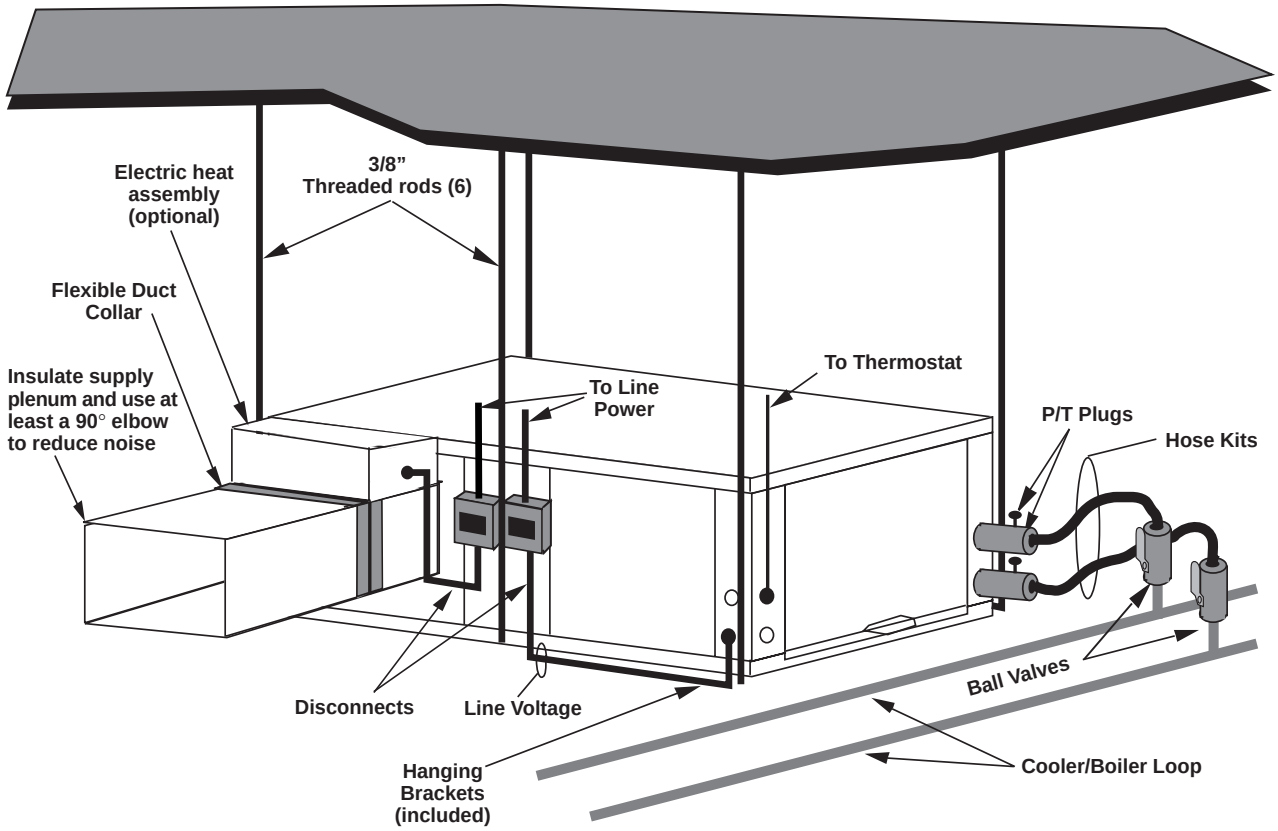
Closed Loop Cooler/Boiler Systems

⚠ **CAUTION:** *Water piping exposed to outside temperatures may be subject to freezing.*

The water loop is usually maintained between 60°F and 90°F (Premier 2 units allow 25°F - 110°F EWT) for proper heating and cooling operation. This is accomplished with a cooling tower and a boiler (see Figure 6). To reject excess heat from the water loop, use a closed circuit evaporative cooler or an open type cooling tower with a secondary heat exchanger between the tower and the water loop. If an open type cooling tower is used without a secondary heat exchanger, continuous chemical treatment and filtering of the water must be performed to ensure the water is free from damaging materials. The water lines should be routed so as not to interfere with access to the unit. Flexible hose connections should be used to minimize vibration transmission.

Before final connection to the unit, the supply and return hose kits must be connected together and the system flushed to remove dirt, piping chips and other foreign material. Normally, a combination balancing and close-off (ball) valve is installed at the return and a rated gate or ball valve is installed at the supply. The return valve can be adjusted to obtain the proper water flow. The valves allow the unit to be removed for servicing.

Figure 6 *- Closed Loop—Cooler/Boiler System*



The proper water flow must be assured to each unit whenever the unit operates. To assure proper flow, use pressure/temperature ports to determine the flow rate. These ports should be located adjacent to the supply and return connections on the unit. The proper flow rate cannot be accurately set without measuring the water pressure drop through the refrigerant-to-water heat exchanger (circuit setters may also be used). See Table 2 on page 22 for water flow and pressure drop information.

NOTE: *For boiler/cooling tower systems with no antifreeze solution, set SW2-2 to the "WELL" position.*

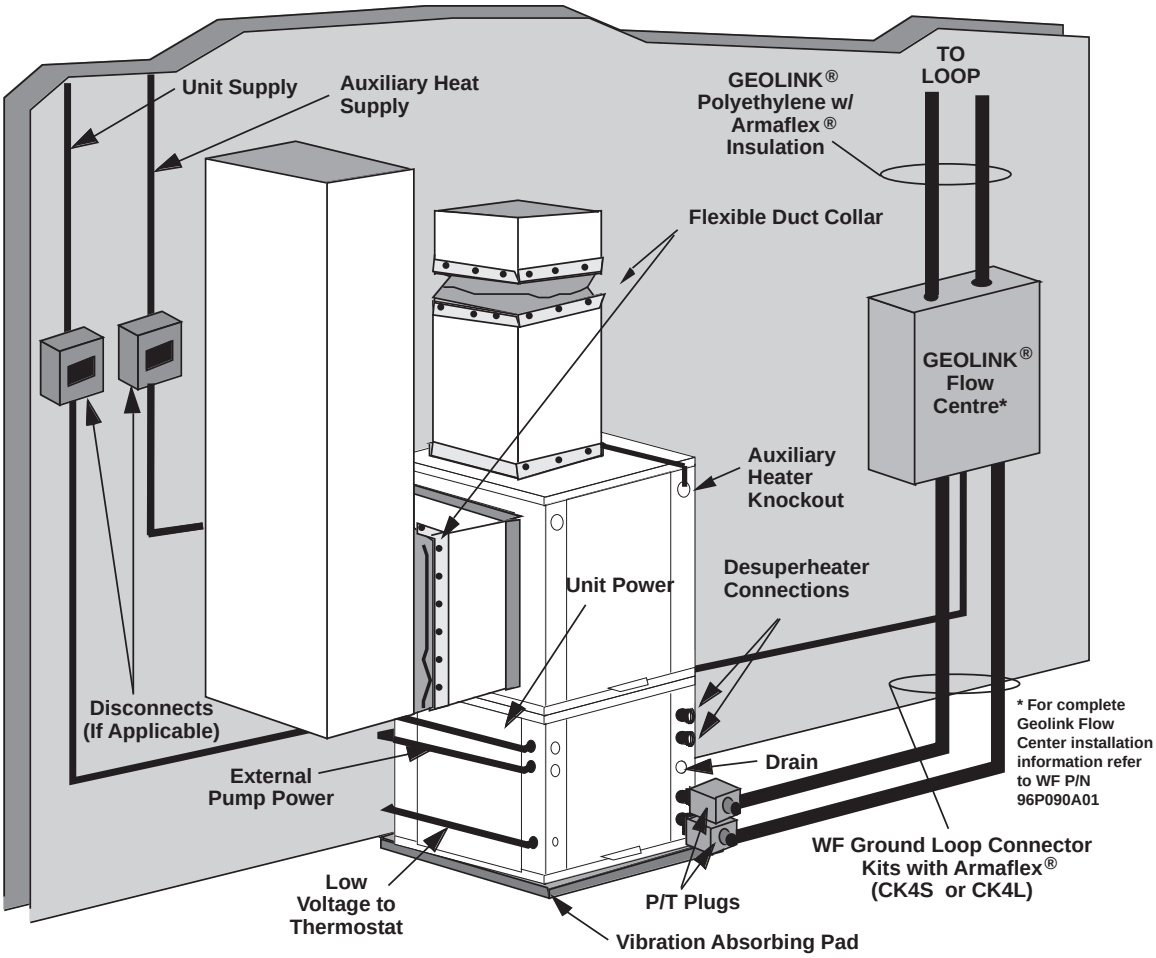
Closed Loop Ground Source Systems

GROUND SOURCE SYSTEMS

NOTE: *For closed loop systems with antifreeze protection, set SW2-2 to the "LOOP" position.*

Once piping is completed between the unit, flow center and the ground loop (see Figure 7 on page 7), final purging and charging of the loop is required. A WaterFurnace flush cart (or a 1.5 HP pump minimum) is needed to achieve adequate flow velocity in the loop to purge air and dirt particles from the loop itself. Antifreeze solution is used in most areas to prevent freezing. Flush the system adequately to remove as much air as possible then pressurize the loop to a static pressure of 50-75 psi (winter) or 40-50 psi (summer). This is normally adequate for good system operation. Loop static pressure will fluctuate with the seasons. Pressures will be higher in the winter months than during the cooling season. This fluctuation is normal and should be considered when initially charging the system.

Figure 7- *Closed Loop: Ground Source Application - Single unit with Flow Center*

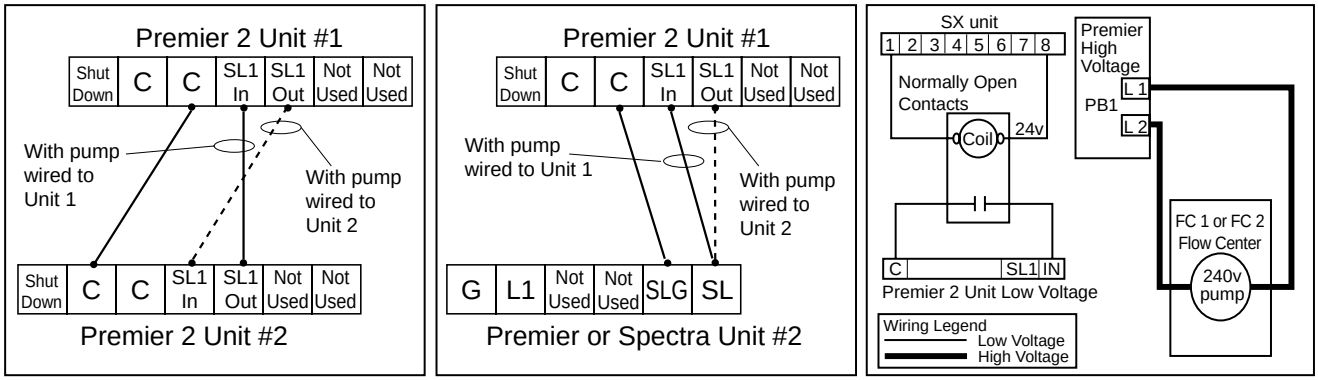


After pressurization, be sure to remove the plug in the end of the loop pump motor(s) (if applicable) to allow trapped air to be discharged and to ensure that the motor housing has been flooded. Ensure that the loop flow center provides adequate flow through the unit by checking the pressure drop across the heat exchanger and comparing it to the figures shown in Table 2 on page 22. Usually 2.5 to 3 gpm of flow per ton of cooling capacity is recommended in earth loop applications. See Figures 4A and 4B on page 12 for loop pump power wiring details.

MULTIPLE UNITS ON ONE FLOW CENTER

When two Premier 2 units are connected to one loop pumping system, pump control is automatically achieved by connecting the slave terminals on connector P2 in both units with 2-wire thermostat wire. These terminals are polarity conscious (see Figure 8 on page 8). The loop pump(s) may be powered from either Premier 2 unit, whichever is more convenient. If either unit calls, the loop pump(s) will automatically start. The use of two units on one flow center is generally limited to a total of six tons of unit capcity.

Figure 8- *Premier 2 Slave Hook-up*



Two Premier 2 units

One Premier 2 unit and one Premier AT or Spectra unit (with optional circut board)

One Premier 2 unit and one Spectra electro-mechanical unit

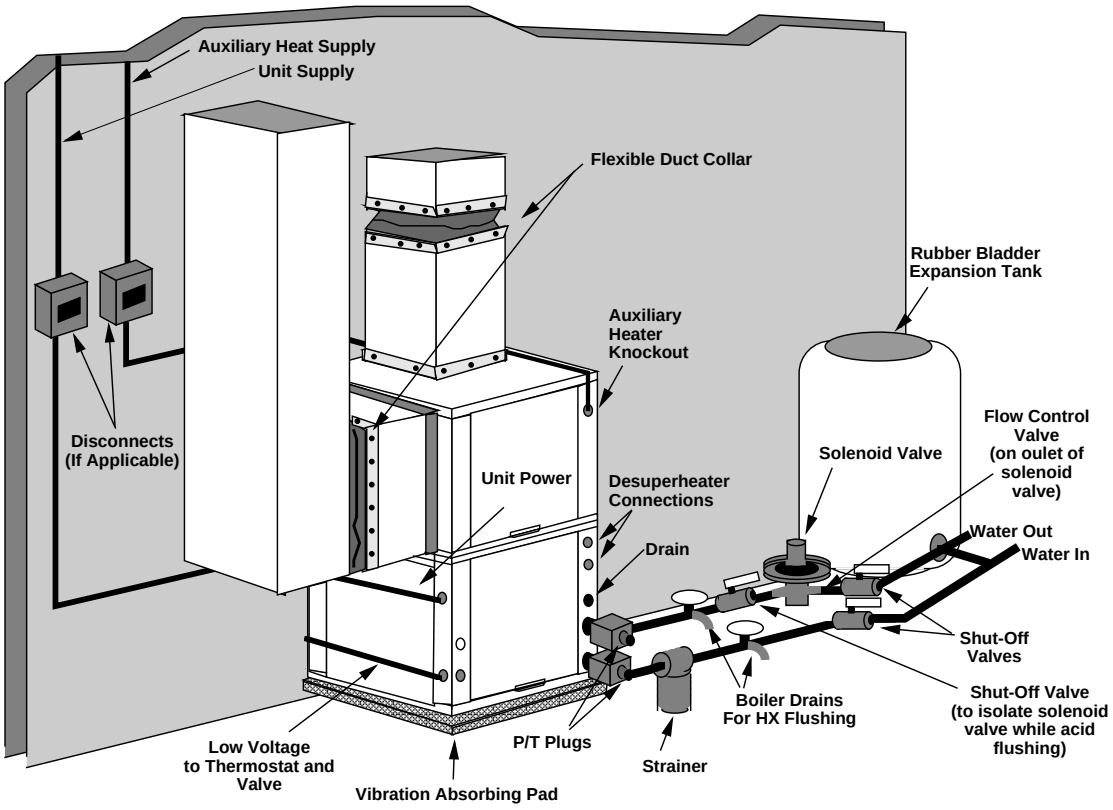
Open Loop Groundwater Systems

OPEN LOOP SYSTEMS

NOTE: *For open loop/groundwater systems or systems that do not contain an antifreeze solution, set SW2-2 to the WELL position.*

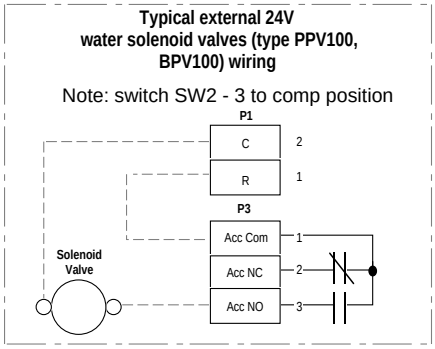
Typical open loop piping is shown below in Figure 9. Always maintain water pressure in the heat exchanger by placing water control valves at the outlet of the unit to prevent mineral precipitation. Use a closed, bladder-type expansion tank to minimize mineral formation due to air exposure. Ensure proper water flow through the unit by checking pressure drop across the heat exchanger and comparing it to the figures in Table 2 on page 22. Normally, about 2 gpm flow rate per ton of cooling capacity (1.5 gpm per ton minimum at 50°F) is needed in open loop systems.

Figure 9 - *Open System: Groundwater Application*



Discharge water from the unit is not contaminated in any manner and can be disposed of in various ways, depending on local building codes (e.g. recharge well, storm sewer, drain field, adjacent stream or pond, etc.) Most local codes forbid using the sanitary sewer for disposal. Consult your local building and zoning department to assure compliance in your area.

Figure 10 - *The water control solenoid is wired between the common pin #2 connector P1 and pin #3 connector P3, and a jumper wire is connected between R and pin #1 connector P3. Notice that DIP switch 2–3, located on the PCB, must be switched to the "Comp" position so the valve will operate with the compressor.*



Desuperheater Connection

WATER TANK PREPARATION

A family of four should have a water heater with approximately a 50-gallon capacity. For families of more than four, use an 80-gallon water heater or two 50-gallon water heaters connected in a series as shown in Figure 13. Electric water heaters are recommended.

Steps:

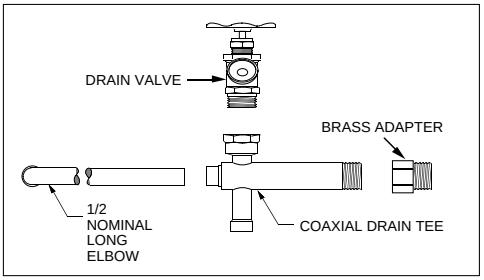
1) Turn off the power to the water heater. **Elements will burn out if energized dry!**
2) Attach a water hose to the water tank drain connection and run the other end of the hose to an open drain or outdoors.
3) Close the cold water inlet valve to the water heater tank.
4) Drain the tank by opening the valve on the bottom of the tank, then open the pressure relief valve or hot water faucet.
5) Flush the tank by opening the cold water inlet valve to the water heater to free the tank of sediments. Close when draining water is clear.
6) Disconnect the garden hose and remove the drain valve from the water heater.

PLUMBING INSTALLATION

Steps:

1) Thread the male end of the coaxial drain tee into the water heater drain port (see Figure 11.
2) Solder the 1/2" copper elbow into the coaxial drain tee with the 90° bend pointing in the correct direction.
3) Install the drain valve on the drain tee assembly.
4) Run interconnection copper tubing (1/2" nominal). The recommended maximum distance is 50 ft. between the unit and water heater (see Figures 12 and 13).
5) To prevent air entrapment in the system, install a vent coupling at the highest point of the interconnecting line.
6) Insulate all exposed surfaces of both connecting water lines with 3/8" wall closed cell insulation.

Figure 11 - *Water Heater Connection Kit*



The optional brass adapter is available for use in areas where local plumbing codes require it.

Figure 12 - *Typical Desuperheater Installation*

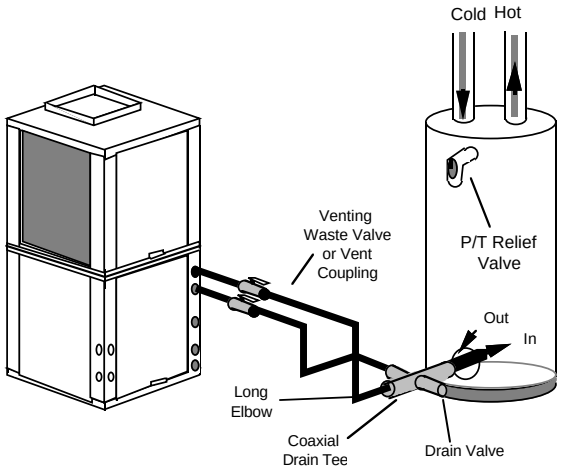
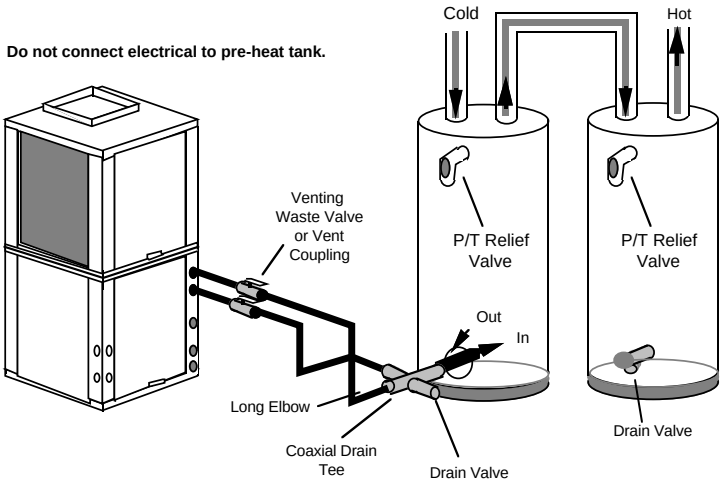


Figure 13 - *Desuperheater Installation In Preheat Tank*



Initial Desuperheater Start Up

WATER TANK REFILL

Steps:

1) Close the drain valve to the water heater.
2) Open the cold water supply to the tank.
3) Open the hot water faucet in the house to bleed air from the system. Then close when full.
4) Depress the handle on the pressure relief valve to bleed any remaining air from the tank then close.
5) If so equipped, unscrew the indicator plug on the motor end of the pump (located in the Premier 2 unit) until all air is purged from the pump, then tighten the plug. Use vent couplings to bleed air from the lines.
6) Carefully inspect all plumbing for water leaks and correct as required.
7) Before restoring electrical supply to the water heater, adjust the temperature setting on the tank.
   - On tanks with both upper and lower elements, the lower element should be turned down to the lowest setting, approximately 100°F. The upper element should be adjusted to 120°F to 130°F. Depending upon the specific needs of the customer, you may want to adjust the upper element differently.
   - On tanks with a single element, lower the thermostat setting to 120°F.
8) After thermostat(s) is adjusted, replace the access cover and restore electrical supply to the water heater.

⚠ **CAUTION:** *Never operate the DHW circulating pump while dry.*

Steps:

1) Make sure that any valves in the desuperheater water circulating circuit are open.
2) Turn on the Premier 2 unit to first stage heating.
3) The DHW pump should be running. Be sure the disable switch for the DHW pump (SW4) is ON. The DHW OFF LED on the unit should not be illuminated.
4) The temperature difference between the water entering and leaving the desuperheater should be 5°F to 15°F. The water flow should be approximately 0.4 gpm per ton of nominal cooling.
5) Allow the unit to heat water for 15 to 20 minutes to be sure operation is normal.
6) When the pump is first started, open the inspection port (if equipped) until water dribbles out, then replace. Allow the pump to run for at least five minutes to ensure that water has filled the circulator properly.

DESUPERHEATER NOTE:

When servicing a unit's refrigeration circuit, it is always good practice to disable the desuperheater pump. This can be accomplished by using the DHW pump disable switch located on the front of the unit cabinet near the LED annunciator panel. The red DHW OFF LED will illuminate, indicating the DHW pump is disabled. **Do not run DHW pump while dry. If the unit is placed in operation before the desuperheater piping is connected, be sure that the pump switch is set to the OFF position.**

Electrical Connections

GENERAL

Be sure the available power is the same voltage and phase as that shown on the unit serial plate. Line and low voltage wiring must be done in accordance with local codes or the National Electric Code, whichever is applicable.

UNIT POWER CONNECTION

Connect the incoming line voltage wires to the "L" side of the contactor as shown in Figures 4A and 4B on page 12. Consult the Unit Electrical Data section on page 25 for correct wire and fuse size.

EXTERNAL LOOP PUMP POWER CONNECTION

If the unit is to be used with an external loop pump (FC1 or FC2 flow center), the pump(s) will be connected to the terminals on PB1 in the unit electrical box as shown in Figures 4A and 4B on page 12. The pumps will automatically be cycled as required by the unit or by a slave signal from another Premier 2 unit sharing the flow center (see Figure 8 on page 8).

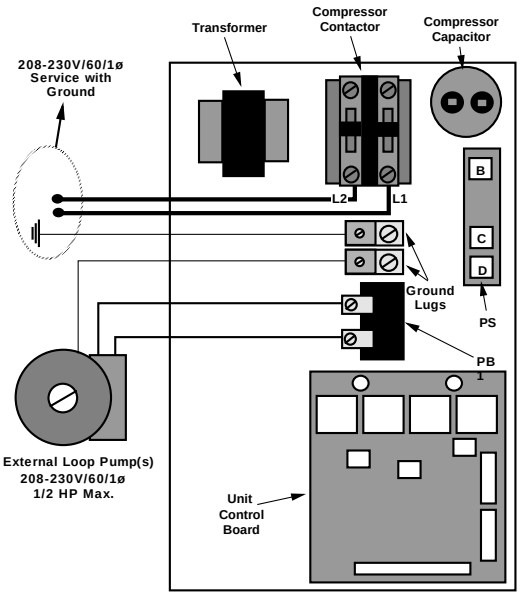


Figure 14A - *Premier 2 Line Voltage 208-230/60/1*

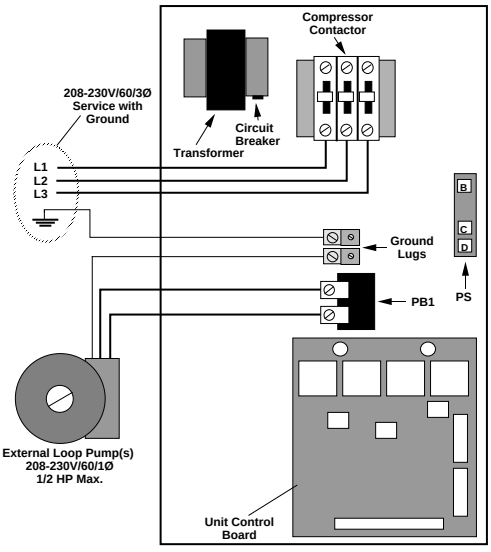


Figure 14B - *Premier 2 Line Voltage 208-230/60/3*

ACCESSORY RELAY

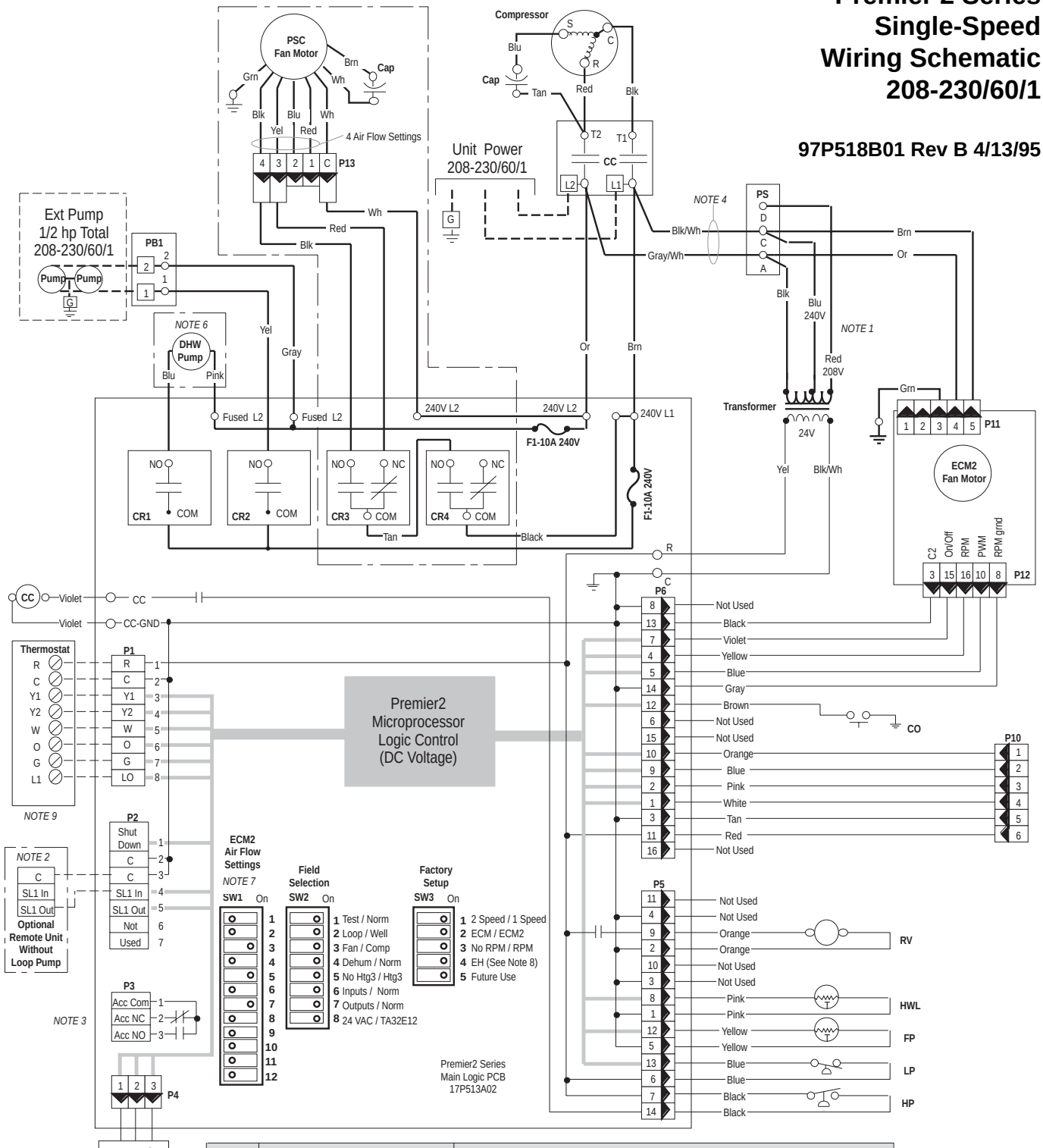
A set of "dry" contacts has been provided to control accessory devices, such as water solenoid valves on open loop installations, electronic air cleaners, humidifiers, etc. **This relay contact should be used only with 24 volt signals and not line voltage power.** The relay has both normally open and normally closed contacts and can operate with either the fan or the compressor. Use DIP switch SW2-3 to cycle the relay with fan or compressor. The relay contacts are available on terminals #2 and #3 of P3. See the wiring schematic on pages 13-16 for details.

208 VOLT OPERATION

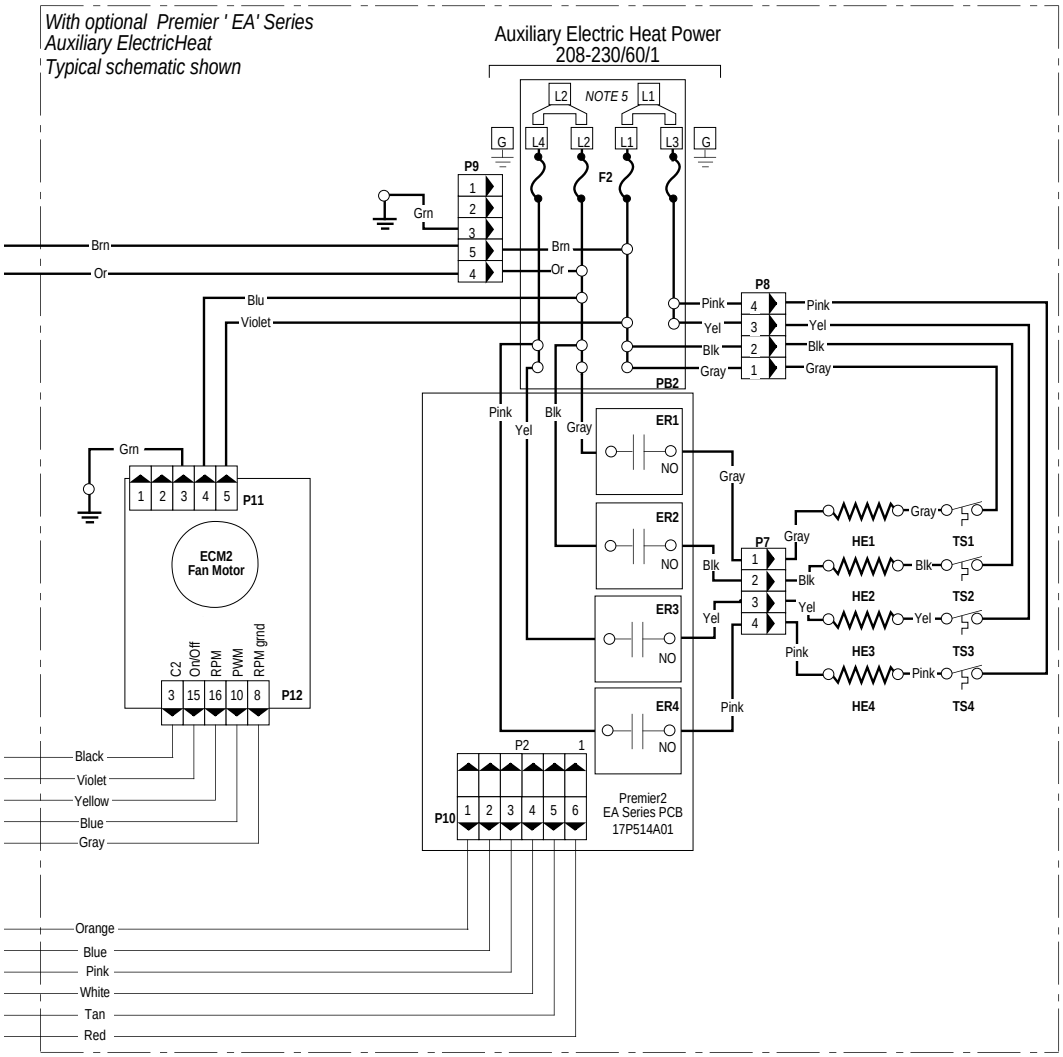
All 208-230 volt units are factory wired for 230 volt operation. For 208 volt operation, the red and blue transformer wires must be switched on terminal strip PS. See the wiring schematic on pages 13-16 for details.

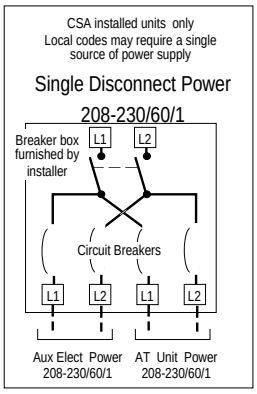
Premier 2 Series Single-Speed Wiring Schematic 208-230/60/1

97P518B01 Rev B 4/13/95



LED	Normal Display Mode	Diagnostic Modes			
		Current Fault Status	Inputs	Outputs	Outputs2
	Field Selection DIPs - #1 On, #6 On, #7 On	#1 Off, #6 On, #7 On	#6 Off, #7 On	#6 On, #7 Off	#6 Off, #7 Off
Drain	Drain Pan Overflow Lockout	Drain Pan Overflow	Y1	Compressor	Blower Lo
Water Flow	FP Thermistor (loop<15°F,well<30°F) Lockout	FP Thermistor (loop<15°F, well<30°F)	Y2	Not Used	Blower Med
High Press	High Pressure > 380 PSI Lockout	High Pressure > 380 PSI	O	RV	Blower Hi
Low Press	Low Pressure < 15 PSI Lockout	Low Pressure < 15 PSI	G	FAN	Aux Heat #1
Airflow	ECM2 RPM < 100 rpm Lockout	ECM2 RPM < 100 rpm	W	DHW Pump	Aux Heat #2
Status	Microprocessor Malfunction*	Not Used	SL1	Loop Pump	AuxHeat #3
DHW Limit	HWL Thermistor > 130°F	HWL Thermistor > 130°F	Not Used	Not Used	Aux Heat #4
DHW off	DHW Pump Switch Off	DHW Pump Switch Off	--	--	--




CSA installed units only
Local codes may require a single source of power supply
Single Disconnect Power
208-230/60/1
Breaker box furnished by installer
Circuit Breakers
Aux Elect Power 208-230/60/1
AT Unit Power 208-230/60/1

Notes:

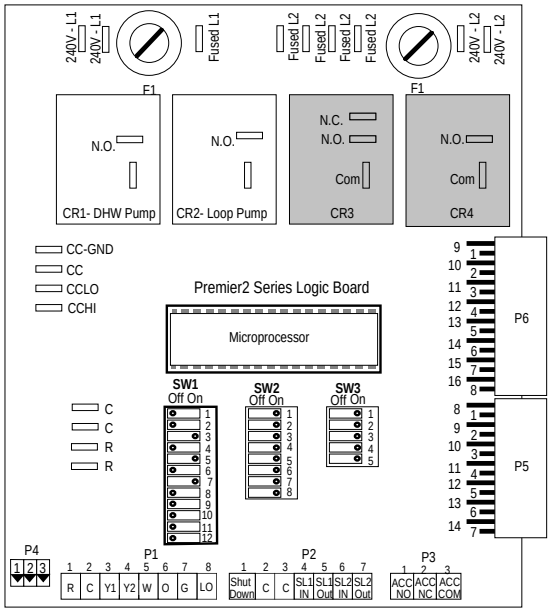
1 - Switch blue and red wires for 208V operation.
2 - Connection of remote unit that does not have a loop pump for slave operation.
3 - 24V Accessory relay (see SW2 - 3 for description of operation).
4 - The blk/wh and gray/wh wires are removed when Aux Heat is installed .
5 - Buss lugs L1 and L2 can be removed and dual power wire sets connected directly to box lugs L1, L2, and L3, L4.
6 - DHW pump only in models with hot water generation option.
7 - Air Flow Configuration Example: SW1 configured for dip 3 as low, dip 5 as medium, and dip 7 as high speed ECM2 fan.
8 - SW3-4 should be in the ON position when using Premier 2 Electric Heat control 17P514A01, and it should be in the OFF position when using Premier Electric Heat control 17P501A01.
9 - When using thermostat TA32E12, SW2 -8 should be in the "on" position. When using 24VAC thermostats, SW2-8 should be in the "off" position.

Legend

Factory low voltage wiring
Factory line voltage wiring
Field low voltage wiring
Field line voltage wiring
Optional block
DC voltage PCB traces
Internal junction
Quick connect terminal
Wire nut
Field wire lug
Ground
Relay contacts- N.O., N.C.
Fuse
Thermistor
Light emitting diode - Green
Relay coil
Capacitor w/ bleed resistor
Switch - Condensate overflow
Switch - High pressure
Switch - Low pressure
Switch -Hot water On/Off
Polarized connector

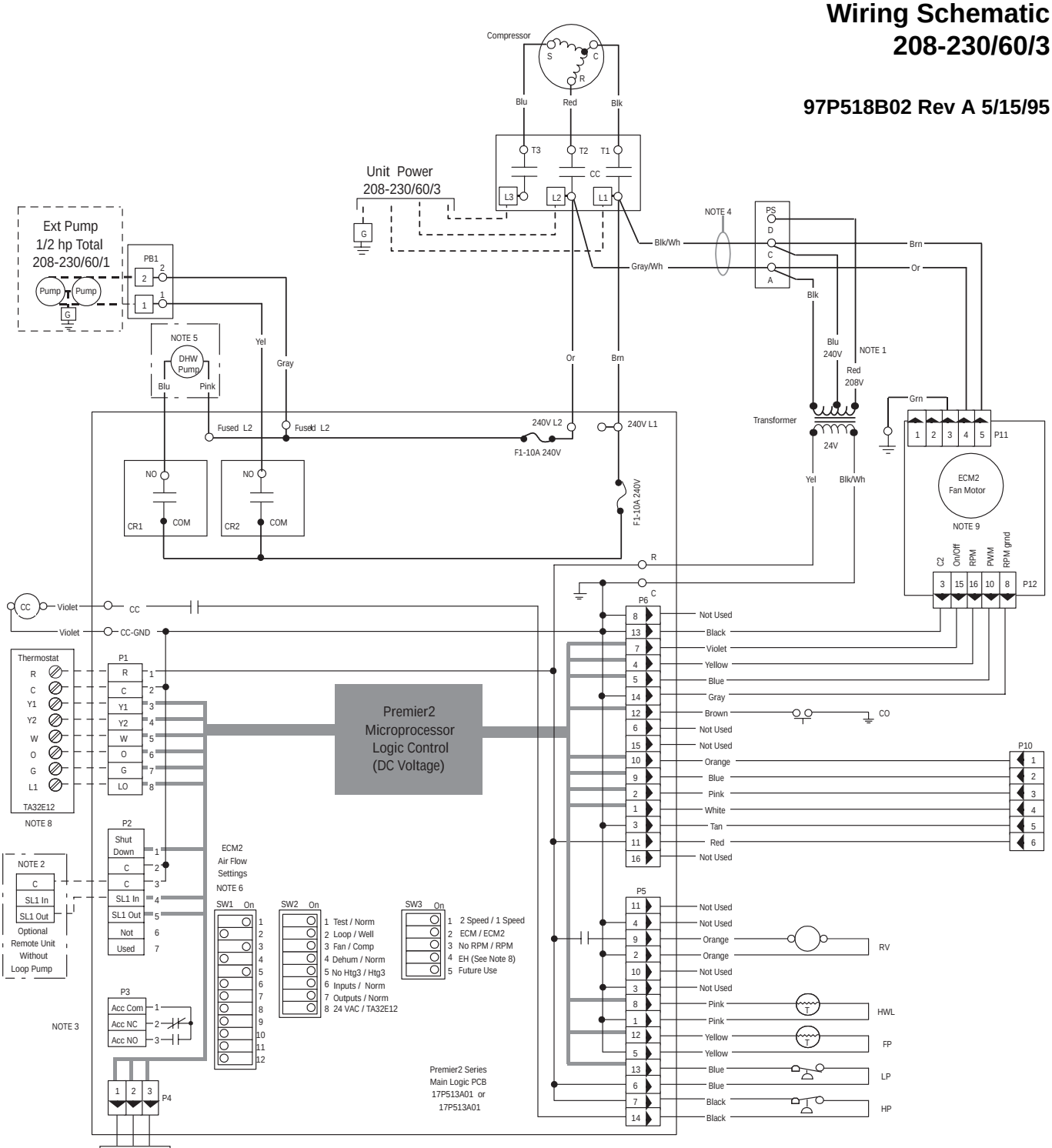
CC -	Compressor contactor
CO -	Condensate overflow sensor
CR1 -	DHW pump relay
CR2-	Loop pump relay
CR3 -	PSC fan speed relay
CR4 -	PSC fan power relay
ER1 to ER4 -	Aux heat stage relays
F1 and F2 -	Fuses
FP -	Freeze protection sensor
HE -	Heater element
HP -	High pressure switch
HWL -	Hot water limit sensor
LP -	Low pressure switch
PB1, PB2 -	Power blocks
PS -	Power strip
RV -	Reversing valve coil
SW1 -	DIP package 12 position
SW2 -	DIP package 8 position
SW3 -	DIP package 5 position
SW4 -	Hot water pump enable switch
TS -	Thermal limit switch

Premier2 Logic Board (Single-Speed Configuration) Physical Layout

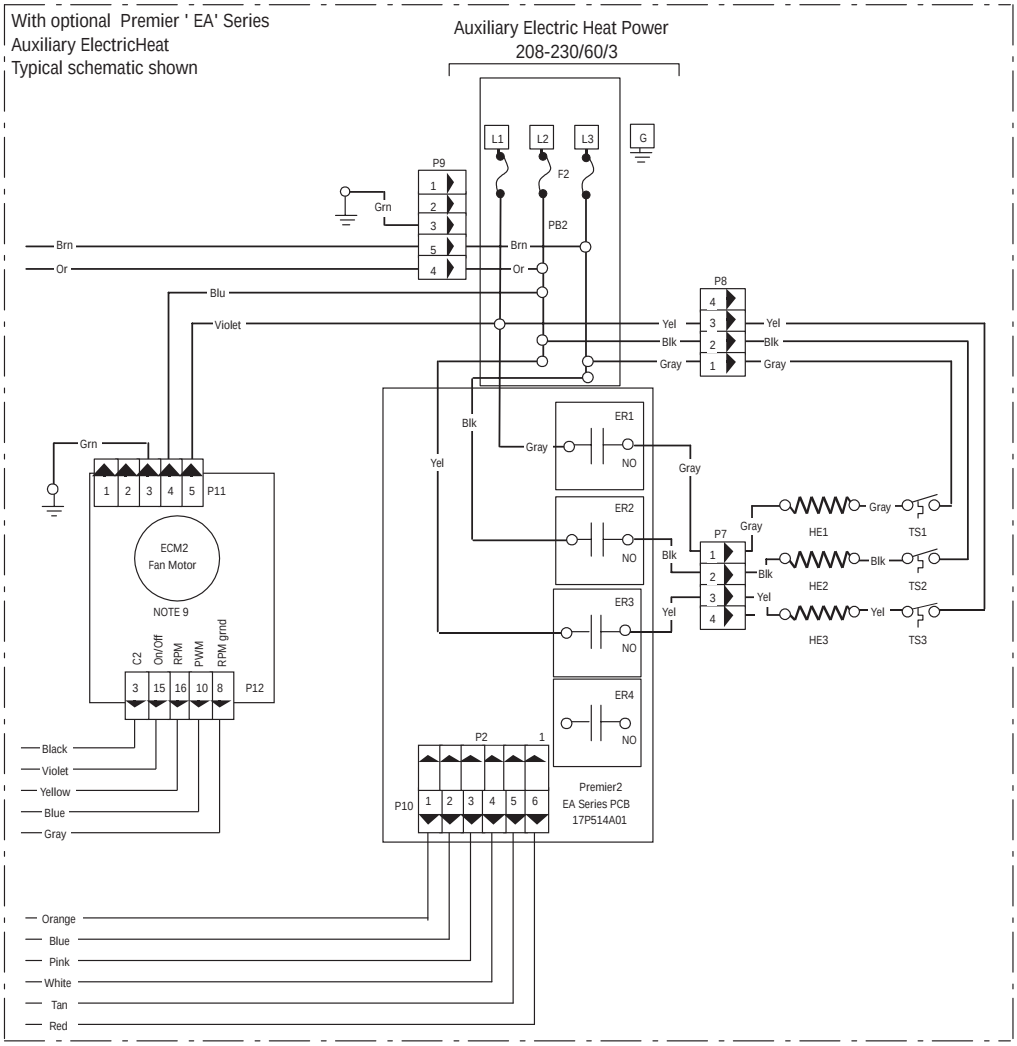


Premier 2 Series Single-Speed Wiring Schematic 208-230/60/3

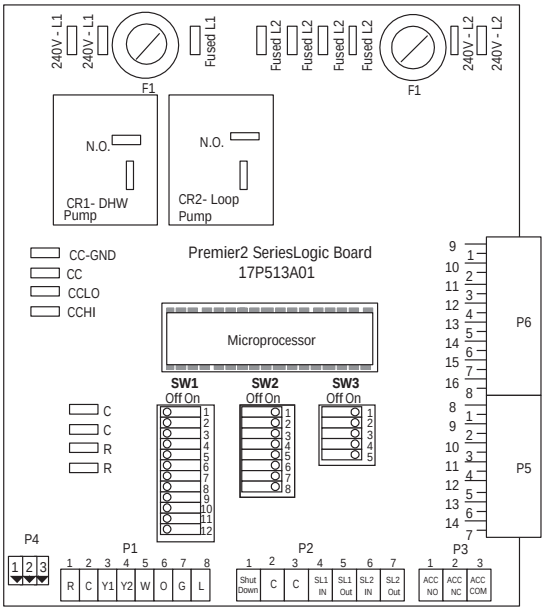
97P518B02 Rev A 5/15/95



LED	Normal Display Mode	Diagnostic Modes			
		Current Fault Status	Inputs	Outputs	Outputs2
	Field Selection DIPs - #1 On, #6 On, #7 On	#1 Off, #6 On, #7 On	#6 Off, #7 On	#6 On, #7 Off	#6 Off, #7 Off
Drain	Drain Pan OverfLow Lockout	Drain Pan Overflow	Y1	Compressor	Blower Lo
Water Flow	FP Thermistor (Loop<15° F,well<30° F) Lockout	FP Thermistor (Loop<15° F, well<30° F)	Y2	Not Used	Blower Med
High Press	High Pressure > 380 PSI Lockout	High Pressure > 380 PSI	O	RV	Blower Hi
Low Press	Low Pressure < 15 PSI Lockout	Low Pressure < 15 PSI	G	FAN	Aux Heat #1
Airflow	ECM2 RPM < 100 rpm Lockout	ECM2 RPM < 100 rpm	W	DHW Pump	Aux Heat #2
Status	Microprocessor Malfunction*	Not Used	SL1	Loop Pump	AuxHeat #3
DHW Limit	HWL Thermistor > 130° F	HWL Thermistor > 130° F	Not Used	Not Used	Aux Heat #4
DHW Off	DHW Pump Switch Off	DHW Pump Switch Off	--	--	--



Premier2 Logic Board (Single-Speed Configuration) Physical Layout



Legend

- Factory Low voltage wiring
- Factory Line voltage wiring
- Field low voltage wiring
- Field line voltage wiring
- Optional block
- DC Voltage PCB traces
- Internal junction
- Quick connect terminal
- Wire nut
- Field wire lug (L1)
- Ground
- Relay Contacts- N.O., N.C.
- Fuse
- Thermistor
- Light emitting diode - Green
- Relay coil
- Capacitor w/ bleed resistor
- Switch - Condensate overflow
- Switch - High pressure
- Switch - Low pressure
- Switch -Hot Water On/Off
- Polarized connector (P 2 3 1)

CC -	Compressor Contactor	LP -	Low pressure switch
CO -	Condensate overflow sensor	PB1, PB2 -	Power blocks
CR1 -	DHW pump relay	PS -	Power strip
CR2-	Loop pump relay	RV -	Reversing Valve coil
CR3 -	PSC Fan Speed Relay	SW1 -	DIP package 12 position
CR4 -	PSC Fan Power Relay	SW2 -	DIP package 8 position
F1 and F2 -	Fuses	SW3 -	DIP package 5 position
FP -	Freeze protection sensor	SW4 -	Hot water pump enable switch
HE -	Heater element	TS -	Thermal limit switch
HP -	High pressure switch	HWL -	Hot water limit sensor
ER1 to ER4 -	Aux heat stage relays		

Notes:

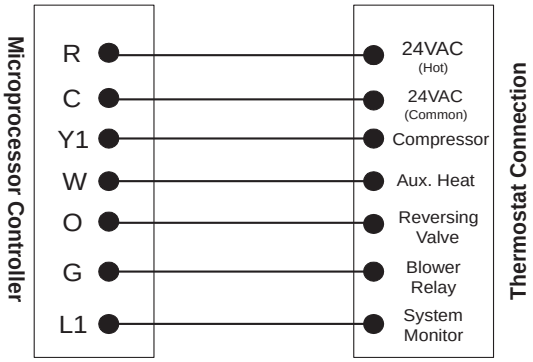
1 - Switch blue and red wires for 208V operation.
2 - Connection of remote unit that does not have a loop pump for slave operation.
3 - 24V Accessory relay (see SW2 - 3 for description of operation)
4 - The blk/wh and gray/wh wires are removed when Aux Heat is installed (ECM2 Only).
5 - DHW pump only in models with hot water generation option.
6 - Air Flow Configuration Example: SW1 configured for dip 3 as low, dip 5 as medium, and dip 7 as high speed ECM2 fan.
7 - SW3-4 should be in the ON position when using Premier 2 Electric Heat control 17P514A01, and it should be in the OFF position when using Premier Electric Heat control 17P501A01.
8- When using thermostat TA32E12, SW2 -8 should be in the "on" position. When using 24VAC thermostats, SW2-8 should be in the "off" position.

Thermostats

INSTALLATION

Position the thermostat subbase against the wall so that it is level and the thermostat wires protrude through the middle of the subbase. Mark the position of the subbase mounting holes and drill holes with a 3/16" bit. Install supplied anchors and secure base to the wall. Thermostat wire must be 8-conductor 18 AWG wire. Strip the wires back 1/4" (longer strip lengths may cause shorts) and insert the thermostat wires into the WaterFurnace Premier 2 connector as shown in Figure 15. Tighten the screws to insure tight connections. The thermostat has the same type connectors, requiring the same wiring. See instructions enclosed in the thermostat for detailed installation and operation information.

Figure 15 - *Thermostat Wiring*



NOTE: *that dip switch SW2-#8 is required to be in the OFF position for the Premier2 control to recognize the 24VAC thermostat inputs. SW2-#8 must be when using the TA32E12 thermostat.*

Microprocessor Control Operation

HEATING OPERATION

NOTE: *At first power-up, a four minute delay is employed before the compressor is energized.*

Heating, 1st Stage (Y1)

The fan motor is started on low speed immediately, the loop pump is energized 5 seconds after the Y1 input is received, and the compressor is energized 10 seconds after the Y1 input. In the ECM2 version, the fan is switched to medium speed 15 seconds after Y1 input. The hot water pump is cycled 30 seconds after the Y1 input.

Heating, 2nd Stage (Y1,Y2)

The hot water pump is de-energized, which directs all heat to satisfying the thermostat, and the fan changes to high speed 15 seconds after the Y2 input.

Heating, 3rd Stage (Y1,Y2,W)

The first stage of resistance heat is energized 10 seconds after W input, and with continuous third-stage demand, the additional stages of resistance heat engage sequentially every 5 minutes.

Emergency Heat (W Only)

The fan is started on high speed, and the first stage of resistance heat is energized 10 seconds after the W input. Continuing demand will engage the additional stages of resistance heat sequentially every 2 minutes.

COOLING OPERATION

In all cooling operations, the reversing valve directly tracks the “O” input. Thus anytime the “O” input is present, the reversing valve will be energized.

Cooling, 1st Stage (Y1,O)

The fan motor is started on low speed immediately, the loop pump is energized 5 seconds after the Y1 input is received, and the compressor is energized 10 seconds after the Y1 input. The fan is switched to medium speed 15 seconds after Y1 input (remains in low speed if in dehumidification mode) and the hot water pump is cycled 30 seconds after the Y1 input.

Cooling, 2nd Stage (Y1,Y2,O)

The fan changes to high speed (medium in dehumidification mode) 15 seconds after the Y2 input.

FAN (G Only)

The fan starts on low speed. Regardless of fan input (G) from the thermostat, the fan will remain on low speed for 30 seconds at the end of each heating, cooling or emergency heat cycle.

LOCKOUT CONDITIONS

During lockout mode, the appropriate unit and thermostat lockout LEDs will illuminate. The compressor, loop pump, hot water pump and accessory outputs are de-energized. Unless the lockout is caused by an ECM2 low RPM fault, the fan will continue to run on low speed, and if the thermostat calls for second- or third-stage heating, emergency heat operation will occur.

Lockout modes of any kind can be reset at the thermostat after a 5 second waiting period, which restores normal operation but keeps the unit lockout LED illuminated. Interruption of power to the unit will reset a lockout without a waiting period and clear all lockout LEDs.

High Pressure

This lockout mode occurs when the normally closed safety switch is momentarily opened.

Low Pressure

This lockout mode occurs when the normally closed switch is opened for 30 continuous seconds.

Freeze Protection (Water Flow)

This lockout mode occurs when the freeze thermistor temperature (located between the TXV and coax) is at or below the selected freeze protection point (well 30°F or loop 15°F) for 30 continuous seconds.

Condensate Overflow

This lockout mode occurs when the condensate overflow level has been reached for 30 continuous seconds.

Fan RPM

The Premier 2 control board monitors fan RPM to sense if the fan is operating. This lockout mode occurs if the fan RPM falls below the low RPM limit (100 RPM) for 30 continuous seconds.

AIRFLOW SELECTION DIP SWITCHES (SW1)

See Fan Speed section on page 19.

FIELD SELECTION DIP SWITCHES (SW2)

An 8-position DIP switch package on the Premier 2 control allows the following field selectable options:

1-Service Test Mode

This DIP switch on the control allows field selection of normal or test operational modes. The test mode accelerates most timing functions 16 times to allow for faster troubleshooting. Test mode also allows viewing the current status of the fault inputs on the LED display.

2-Freeze Protection Setting

This DIP switch allows field selection of freeze thermistor fault sensing temperatures for well water or antifreeze protected earth loops.

3-Accessory Relay

This DIP switch allows field selection of the accessory relay to operate with the compressor or fan.

4-Dehumidification/Normal. Fan speed control

This DIP switch allows field selection of the dehumidification mode, which uses the low and medium fan speeds for cooling or the medium and high fan speeds for cooling in the normal mode.

5-Auxiliary Off

This DIP switch disables third-stage heating. Full emergency heat would in any event still be available if needed.

6-Diagnostics-Inputs

This DIP switch allows viewing the inputs from the thermostat to the control board such as Y1, Y2, O, G, W, SL1-In on the LED display.

7-Diagnostics-Outputs

This DIP switch allows viewing the outputs from the control board such as compressor, reversing valve, blower, hot water pump, and loop pump on the LED display.

8-Thermostat Selection

This DIP switch allows field selection of thermostat type connected to the Premier 2 control. If using a TA32E12, the DIP switch must be in the ON position. The DIP switch should be in the OFF position for 24 VAC thermostats.

FACTORY SETUP DIP SWITCHES (SW3)

A 5-position DIP switch package on the Premier 2 control allows the following factory setup options:

1-Two-Speed/Single-Speed

This DIP switch configures the control for single-speed compressor operation or two-speed compressor operation.

2-ECM/ECM2

This DIP switch configures the control to operate with the ECM blower motor (motor with square control on end) or with the ECM2 (round) blower motor.

3-No RPM/RPM

This DIP switch configures the control to monitor the RPM output of an ECM/ECM2 blower motor. When using a PSC blower motor, the control should be configured for no RPM sensing.

4-AT EH Board/Premier 2 EH Board

This DIP switch configures the control to operate with the Premier 2 electric heat control board (6-position connector) or with the AT electric heat control board (3-position connector).

5-Future Use

Not used at this time.

Blower Speed

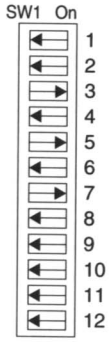
ECM2 blower motors have a 12-speed selector DIP switch on the Premier 2 logic board (SW1) and are factory set for optimum performance. To change speeds, select the appropriate speeds on DIP switch SW1. Refer to the blower performance table for specific airflow and switch information.

Blower Performance

MODEL	MAX ESP	AIRFLOW DIP SWITCH SETTINGS											
		1	2	3	4	5	6	7	8	9	10	11	12
AT019	0.50	300	400 L	**500 M**	**600 H**	**700**	**800**						
AT022	0.50		400	500 L	**600 M**	**700 H**	**800**	**900**					
AT028	0.50		400	500 L	600	**700 M**	**800**	**900 H**	**1000**	**1100**			
AT034	0.50				600	700 L	800	**900 M**	**1000**	**1100 H**	**1150**	**1225**	**1300**
AT040	0.50	650	750	850 L	950	**1050 M**	**1150**	**1250**	**1325 H**	**1375**	**1475**		
AT046	0.50	650	750	850	950	**1050 L**	**1150**	**1250 M**	**1325**	**1375**	**1475**	**1550 H**	**1600**
AT040 w/1hp*	0.75	800 L	**1000 M**	**1100**	**1300 H**	**1500**							
AT046 w/1hp*	0.75	800	1000 L	1100 M	**1300**	**1500 H**	**1600**	**1800**					
AT056	0.75	750	900	1000	1200 L	**1400 M**	**1600**	**1700**	**1850 H**	**2000**	**2200**	**2300**	**2400**
AT066	0.75	750	900	1000	1200	1400 L	1600	**1700 M**	**1850**	**2000**	**2200 H**	**2300**	**2400**

Factory settings are at recommended L-M-H DIP switch locations.
Factory L setting is the minimum allowed for cooling.
M-H settings must be located within boldface CFM range.

* With optional one horsepower fan motor.
CFM is controlled within ± 5% up to the maximum ESP.
Max ESP includes allowance for wet coil and standard filter.



A 12-position DIP switch package on the Premier 2 control allows the airflow levels to be set for Low, Medium, and High speed when using the ECM2 blower motor.

Only three of the DIP switches can be in the ON position. The first ON switch (the lowest position number) determines the "low speed fan" setting. The second one determines the "medium speed fan" setting, and the third determines the "high speed fan" setting.

The example to the left shows SW1 on the Premier 2 control board configured for the following AT028 airflow settings:
Low Speed Fan: 500 CFM
Medium Speed Fan: 700 CFM
High Speed Fan: 900 CFM

Unit Start Up

BEFORE POWERING UNIT, check the following:

- ❑ High voltage is correct and matches nameplate.
- ❑ Fuses, breakers and wire size are correct.
- ❑ Low voltage wiring is complete.
- ❑ Piping has been completed, and the water system is cleaned and flushed.
- ❑ Air is purged from the closed loop system.
- ❑ Isolation valves are open, and water control valves or loop pumps are wired.
- ❑ Condensate line is open and correctly pitched.
- ❑ Black/white and gray/white wires in unit control box have been removed if auxiliary heat has been installed in models 016-066.
- ❑ DIP switches are set correctly.
- ❑ DHW pump switch is off unless piping is completed and air has been purged.
- ❑ Blower rotates freely, and foam shipping support has been removed.
- ❑ Blower speed is correct (DIP switch setting).
- ❑ Air filter is clean and in position.
- ❑ Service/access panels are in place.
- ❑ Return air temperature is between 50°F to 80°F in heating and 60°F to 95°F in cooling.
- ❑ Air coil is clean.

START-UP PROCEDURE:

NOTE: *Complete the Equipment Start-Up/Commissioning Check Sheet (WFS147) during this procedure. Refer to thermostat operating instructions and complete the start-up procedure.*

1) Initiate a control signal to energize the blower motor. Check blower operation.
2) Initiate a control signal to place the unit in the cooling mode. Cooling setpoint must be set below room temperature.
3 First stage cooling will energize after a time delay.
4) Be sure that the compressor and water control valve or loop pumps are activated.
5 Verify that the water flow rate is correct by measuring the pressure drop through the heat exchanger using the P/T plugs and comparing to water pressure drop found on Table 2 on page 22.
6) Check the temperature of both the supply and discharge water. Refer to Table 1 on page 21.
7) Check for an air temperature drop of 15 to 25 degrees Fahrenheit across the air coil, depending on the fan speed and entering water temperature.
8) Adjust the cooling setpoint above the room temperature and verify that the compressor and water valve or loop pumps deactivate.
9) Initiate a control signal to place the unit in the heating mode. Heating setpoint must be set above room temperature.
10) First stage heating will energize after a time delay.
11) Check the temperature of both the supply and discharge water. Refer to Table 1 on page 21.
12) Check for an air temperature rise of 20 to 35 degrees Fahrenheit across the air coil, depending on the fan speed and entering water temperature.
13) If auxiliary electric heaters are installed, increase the heating setpoint until the electric heat banks are sequenced on. All stages of the auxiliary heater should be sequenced on when the thermostat is in the Emergency Heat mode. Check amperage of each element.
14) Adjust the heating setpoint below room temperature and verify that the compressor and water valve or loop pumps deactivate.
15) During all testing, check for excessive vibration, noise or water leaks. Correct or repair as required.
16) Set system to desired normal operating mode and set temperature to maintain desired comfort level.
17) Instruct the owner/operator in the proper operation of the thermostat and system maintenance. .
18) **BE CERTAIN TO FILL OUT AND FORWARD ALL WARRANTY REGISTRATION PAPERS TO WFI.**

NOTE: *If performance during any mode appears abnormal, refer to the troubleshooting section on page 24.*

Table 1 *- Temperature Change Through Heat Exchanger*

Water Flow Rate (GPM)	Water Temperature Change (Deg F)	
	Rise (Clg)	Drop (htg)
For Closed Loop: Ground source or cooler/boiler systems at 3 gpm/ton	9 - 12	4 - 8
For Open Loop: Ground water systems at 1.5 gpm/ton	20 - 26	10 - 17

Table 2 - Water Pressure Drop Table

UNIT	GPM	Pressure Drop (PSI)				
		30° EWT	50° EWT	70° EWT	90° EWT	110° EWT
010	1.5	2.1	2.0	2.0	1.9	1.8
	2.0	3.4	3.2	3.1	3.0	2.9
	2.5	5.2	4.9	4.7	4.6	4.5
013	1.5	2.0	1.9	1.9	1.8	1.7
	2.5	4.6	4.4	4.2	4.1	4.0
	3.5	8.1	7.7	7.4	7.2	7.0
016	2.0	3.0	2.9	2.8	2.7	2.6
	3.0	5.9	5.7	5.5	5.3	5.1
	4.0	9.7	9.3	9.0	8.7	8.4
019	3.0	1.2	1.2	1.1	1.1	1.1
	4.0	2.1	2.0	2.0	1.9	1.8
	5.0	3.5	3.3	3.2	3.1	3.0
022	3.0	1.5	1.4	1.3	1.3	1.3
	4.5	3.2	3.1	3.0	2.9	2.8
	6.0	6.0	5.8	5.6	5.4	5.2
028	4.0	1.2	1.2	1.1	1.1	1.1
	5.5	2.1	2.0	2.0	1.9	1.8
	7.0	3.2	3.1	3.0	2.9	2.8
034	5.0	2.4	2.2	2.2	2.1	2.0
	7.0	3.9	3.7	3.6	3.5	3.4
	9.0	6.2	5.9	5.7	5.5	5.3
040	5.0	2.1	2.0	2.0	2.0	1.9
	8.0	4.7	4.5	4.3	4.2	4.1
	11.0	9.5	9.0	8.7	8.4	8.1
046	6.0	2.7	2.6	2.2	2.1	2.0
	9.0	5.5	5.2	4.7	4.6	4.5
	12.0	8.8	8.3	7.6	7.4	7.2
056	8.0	3.0	2.9	2.8	2.7	2.6
	11.0	5.5	5.2	4.8	4.7	4.6
	14.0	8.6	7.2	7.0	6.8	6.6
066	10.0	4.3	4.0	3.5	3.4	3.3
	13.0	7.0	6.7	5.8	5.6	5.4
	16.0	10.7	10.3	8.9	8.6	8.3

Preventative Maintenance

WATER COIL MAINTENANCE

1) Keep all air out of the water. An open loop system should be checked to ensure that the well head is not allowing air to infiltrate the water line. Lines should always be airtight.
2) Keep the system under pressure at all times. It is recommended in open loop systems that the water control valve be placed in the discharge line to prevent loss of pressure during off cycles. Closed loop systems must have positive static pressure.

NOTE: On open loop systems, if the installation is in an area with a known **high mineral content (125 ppm or greater)** in the water, it is best to establish with the owner a periodic maintenance schedule so the coil can be checked regularly. Should periodic coil cleaning be necessary, use standard coil cleaning procedures which are compatible with either the cupro-nickel or copper water lines. Generally, the more water flowing through the unit the less chance for scaling.

OTHER MAINTENANCE

Filters

Filters must be clean to obtain maximum performance. They should be inspected monthly under normal operating conditions and be replaced when necessary. Units should never be operated without a filter.

Condensate Drain

In areas where airborne bacteria produce a slime in the drain pan, it may be necessary to treat chemically to minimize the problem. The condensate drain can pick up lint and dirt, especially with dirty filters. Inspect twice a year to avoid the possibility of overflow.

Air Coil

The air coil must be cleaned to obtain maximum performance. Check once a year under normal operating conditions and, if dirty, brush or vacuum clean. Care must be taken not to damage the aluminum fins while cleaning.

CAUTION: Fin edges are sharp.

NOTE: *To obtain maximum performance, the air coil should be cleaned before start-up. A 10 percent solution of dishwasher detergent and water is recommended for both sides of coil; a thorough water rinse should follow.*

ECM2 Fan Motors

ECM2 Blower Motors are equipped with sealed ball bearings and require no periodic oiling.

Desuperheater Coils

See Water Coil Maintenance section above.

Troubleshooting

CONTROLS

To check the unit control board for proper operation:

1) Disconnect thermostat wires at the control board.
2) Jumper the desired test input (Y1, Y2, W, O or G) to the C terminal with the SW2-8 in the "ON" position) to simulate a thermostat signal.
3) If control functions properly:
   - Check for thermostat and field control wiring (use the diagnostic inputs mode).
4) If control responds improperly:
   - Ensure that component being controlled is functioning (compressor, Blower, Revering valve, etc.).
   - Ensure that wiring from control to the component is functioning (use the diagnostic outputs mode).
   - If steps above check properly, replace unit control.

Note: Refer to the wiring schematic on pages 13-16 for additional information.

REFRIGERANT SYSTEM

NOTE: *Verify that air and water flow rates are at proper levels before servicing the refrigerant circuit.*

To maintain sealed circuit integrity, do not install service gauges unless unit operation appears abnormal (refer to the unit operating pressores on page 25). If superheat and subcooling are outside recommended ranges, an adjustment to the refrigerant charge may be necessary.

Replacement Procedures

OBTAINING PARTS

When contacting WFI for service or replacement parts, refer to the model number and serial number of the unit as stamped on the serial plate attached to the unit. If replacement parts are required, mention the date of installation of the unit and the date of failure, along with an explanation of the malfunctions and a description of the replacement parts required.

IN-WARRANTY MATERIAL RETURN

Material may not be returned except by permission of authorized WFI warranty personnel. Contact your local distributor or the WFI warranty department for warranty return authorization and assistance.

Unit Operating Pressures*

Entering Water Temp °F	Water Flow GPM/Ton	Cooling - No Desuperheater**						Heating - No Desuperheater					
		Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat	Sub-cooling	Water Temp Rise °F	Air Temp Drop °F DB	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat	Sub-cooling	Water Temp Drop °F DB	Air Temp Rise °F
30	1.5	-	-	-	-	-	-	34-39	163-183	9-14	5-9	7.6-8.4	14-20
	2.3	-	-	-	-	-	-	37-42	165-185	9-14	5-9	4.8-5.6	16-22
	3.0	-	-	-	-	-	-	38-44	167-186	9-14	5-9	3.4-4.2	16-22
50	1.5	79-85	145-170	10-18	12-25	20-23	20-25	51-58	175-202	10-14	5-9	10.8-11.9	23-29
	2.3	75-83	130-155	10-18	12-25	12-15	20-25	53-62	178-206	10-14	5-9	6.7-8.1	24-30
	3.0	72-82	125-150	10-18	12-25	8-12	20-25	55-65	180-208	10-14	5-9	5.1-5.9	25-31
70	1.5	78-88	180-200	9-14	13-18	19-22	19-24	71-82	215-250	12-16	5-8	14.0-15.2	28-34
	2.3	78-90	169-187	9-14	13-18	11-14	19-24	77-89	203-235	12-16	5-8	9.0-10.2	30-37
	3.0	78-91	160-180	9-14	13-18	7-12	19-24	81-92	200-235	12-16	5-8	6.7-7.9	31-38
90	1.5	79-92	230-272	8-13	13-18	18-21	17-23	-	-	-	-	-	-
	2.3	80-93	215-248	8-13	13-18	10-14	17-23	-	-	-	-	-	-
	3.0	80-93	208-240	8-13	13-18	6-11	17-23	-	-	-	-	-	-

*Based on nominal 400 cfm per ton airflow and 70°F EAT heating and 80/67°F EAT cooling.
**Cooling air and water numbers can vary greatly with changes in humidity.

Unit Electrical Data

208-230/60/1

MODEL	COMPRESSOR		FAN MOTOR FLA	INT PUMP FLA	EXT PUMP FLA	TOTAL UNIT FLA	MIN CIRCUIT AMP	MAX FUSE (USA)	MAX FUSE (CAN)	MAX CKT BRK (CAN)	SUPPLY WIRE	
	RLA	LRA									MIN AWG	MAX FT
AT019C	7.1	38.0	4.0	0.4	5.4	16.9	18.7	25	25	25	10	100
AT022C	9.7	50.2	4.0	0.4	5.4	19.5	21.9	30	30	30	10	90
AT028C	11.6	62.5	4.0	0.4	5.4	21.4	24.3	35	35	35	8	120
AT034D	13.5	72.5	4.0	0.4	5.4	23.3	26.7	40	40	40	8	110
AT040D	16.0	88.0	4.0	0.4	5.4	25.8	29.8	45	45	45	8	90
AT040D*	16.0	88.0	7.0	0.4	5.4	28.8	32.8	45	45	45	8	80
AT046D	17.9	104.0	4.0	0.4	5.4	27.7	32.2	50	50	50	8	90
AT046D*	17.9	104.0	7.0	0.4	5.4	30.7	35.2	50	50	50	8	80
AT056D	23.7	129.0	7.0	0.4	5.4	36.5	42.4	60	60	60	8	70
AT066D	28.8	169.0	7.0	0.4	5.4	41.6	48.8	70	70	70	8	60

All units rated 208-230 (min 197) volt single phase 60 cycle.
All fuses type "D" time delay (or HACR circuit breaker in USA).
Wire length based on one way measurement with 2% voltage drop.
Wire size based on 60°C copper conductor.
* With optional 1 hp ECM2 fan motor.

208-230/60/3

MODEL	COMPRESSOR		FAN MOTOR FLA	INT PUMP FLA	EXT PUMP FLA	TOTAL UNIT FLA	MIN CIRCUIT AMP	MAX FUSE (USA)	MAX FUSE (CAN)	MAX CKT BRK (CAN)	SUPPLY WIRE	
	RLA	LRA									MIN AWG	MAX FT
AT056D	13.5	99.0	7.0	0.4	5.4	26.3	29.7	40	40	40	8	100
AT066D	17.3	123.0	7.0	0.4	5.4	30.1	34.4	40	50	50	8	90

All units rated 208-230 (min 197) volt three phase 60 cycle.
All fuses type "D" time delay (or HACR circuit breaker in USA).
Wire length based on one way measurement with 2% voltage drop.
Wire size based on 60°C copper conductor.

Notes:

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Fort Wayne, IN 46809-9794

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1-800-934-5667
FAX: 1-800-783-5667
http://www.waterfurnace.com

In Canada Call : 1-800-463-8106

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PREMIER 2

Single-Speed Installation and Maintenance Manual

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GEOEXCHANGE

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